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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/384,141	08/27/1999	IKKO FUSHIKI	03797.81834	7425

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EXAMINER	
LAROSE, COLIN M	
ART UNIT	**PAPER NUMBER**
2623	25

DATE MAILED: 12/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/384,141	FUSHIKI ET AL.	
	Examiner	Art Unit	
	Colin M. LaRose	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,6-23,57 and 60-62* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,6-23,57 and 60-62* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Arguments and Amendments

1. Applicants' amendments and/or arguments filed 14 November 2003, have been entered and made of record.

Response to Amendments and Arguments

2. In light of the personal interview conducted on 7 October 2003 and the declaration under 37 CFR § 1.132 by Mr. Stokes filed on 14 November 2003, the previous rejections under 35 USC § 112, first paragraph, have been withdrawn. It is understood, and was understood at the time of the invention, that a gamut expanded sRGB color space is inherently linear with respect to luminance and thus by definition is a physical-based color space and exhibits a 1.0 gamma correction factor.

3. The declaration under 37 CFR § 1.132 filed 14 November 2003 is sufficient to overcome the rejection of all pending claims (1, 4, 6-23, 57, and 60-62) under 35 USC § 103 based upon the fact that Pritchett does not disclose converting a perceptual-based color space of a first device to a physical-based color space, and then converting the physical-based color space to a perceptual-based color space of a second device. As the declaration establishes, all of the color spaces utilized by Pritchett are perceptual-based. Pritchett's gamut expanded RGB space cannot be considered equivalent to the claimed "gamut expanded sRGB" – Pritchett's gamut expanded RGB is merely a bit-extension of RGB without gamma correction; thus, it is perceptual-based. However, the gamut expanded sRGB of the present invention is physical-based.

Therefore, Pritchett does not suggest the concept of converting from a perceptual-based color space (i.e. a first RGB) to a physical-based color space (i.e. XsRGB), and then from the physical-based color space (i.e. XsRGB) to a second perceptual-based color space (i.e. a second RGB). Pritchett teaches that the gamut expanded RGB color space is identical to the RGB color space except for an increase in the number of bits. As a result, there is no motivation for Pritchett to utilize XsRGB, or any other gamut expanded *physical*-based color space, as his gamut expanded color space.

Claim Objections

4. Claim 11 is objected to because of the following informalities: "the source color space" has insufficient antecedent basis. For examination purposes, it is assumed to refer to the color space of the first device.

Claim 23 is objected to because of the following informalities: "the destination device" and "the digitizer" have insufficient antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1, 6, 8-15, 17-23, 57, 61, and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,320,980 by Hidaka in view of the first working draft (7-22-98)

of IEC 61966-2-2: "Colour Measurement and Management in Multimedia Systems and Equipment – Part 2-2: Extended Precision RGB Colour Space" ("IEC 61966-2-2").

Regarding claims 1, 15, 23, 57, 61, and 62, Hidaka discloses a method/apparatus/computer readable medium (figure 7) for providing a color space representation of color images in a color management system, comprising the steps of:

mapping (502) RGB color data values representing an image in a first device (i.e. scanner 501) into XYZ color values of an XYZ color space; and

converting (504 & 505) the XYZ color data values of the XYZ color space into RGB color data values representing an image in a second device (i.e. monitor 507), the RGB color data values of the first device being different from the RGB color data values of the second device (i.e. $R_1G_1B_1$ is different from $R_2G_2B_2$) and the physical appearance of the image in the first device being the same as the physical appearance of the image in the second device (column 9, lines 34-37: the displayed image appears the same as the image scanned).

Hidaka utilizes the XYZ color space as the intermediate space for converting between the different RGB color spaces of two different devices. The XYZ color space is known to be a physical-based color space, and therefore is linear with respect to luminance and has a gamma value of 1.0. On the other hand, the RGB values of Hidaka's devices (501 & 507) are known to correspond to perceptual-based color spaces that are characterized by non-linearity with respect to luminance and a gamma value of 2.2.

Thus, Hidaka teaches the concept of converting from a perceptual-based RGB of a first device to a physical-based color space, and then from the physical-based color space to a perceptual-based RGB color space of a second device. However, Hidaka discloses that the

physical-based color space utilized is XYZ rather than the claimed "gamut expanded sRGB color space"; but it should be noted that Hidaka does not limit his system to the exclusive use of XYZ (column 9, lines 50-54).

IEC 61966-2-2 proposes a standardized gamut expanded sRGB color space, known as XsRGB, or sRGB64. As shown on pages 4 and 5, device-dependent RGB values (R_{8bit}, G_{8bit}, B_{8bit}) are converted to the proposed gamut expanded sRGB color space values (R_{sRGB}, G_{sRGB}, B_{sRGB}) by the set of equations 1-4. The resulting gamut expanded sRGB color space is known to exhibit the qualities of a physical-based color space – it has unity gamma and is linear. Consequently, the gamut expanded sRGB color values are closely related to XYZ color values: as shown in equations 5 and 6, XYZ and gamut expanded sRGB are linear combinations of each other. Equations 7-10 show the inverse operation of converting from gamut expanded sRGB to device-dependent RGB. Thus, IEC 61966-2-2 essentially establishes a standardized physical-based sRGB color space with an gamut expanded.

As Hidaka discloses, the conversion between device-dependent RGB and XYZ was well-known. IEC 61966-2-2 establishes the fact that, at the time of the invention, converting between device-dependent RGB and the standardized gamut expanded sRGB was well-known. Also, IEC 61966-2-2 shows that there is a linear relationship between XYZ and the standardized gamut expanded sRGB. In light of these facts, as well as the fact that XYZ and the standardized gamut expanded sRGB are physical-based, device-independent color spaces, one skilled in the art would have concluded that, for use in Hidaka's system, XYZ and standardized gamut expanded sRGB are functionally equivalent color spaces, and one skilled in the art would have been

motivated to utilize the standardized gamut expanded sRGB in lieu of XYZ in Hidaka's system for at least the advantages of utilizing a recently standardized color space. The linear relationship between XYZ and the standardized gamut expanded sRGB, *inter alia*, suggests that the substitution could have been made with a reasonable expectation of success and without undue experimentation.

Further regarding claims 15 and 23, the gamut expanded sRGB color space of IEC 61966-2-2 includes color values beyond a reproduction range of a specific device (i.e. the gamut expanded sRGB color space is 16 bits/channel, which is beyond the range of a specific device that only utilizes e.g. 8 bits/channel) and includes all colors in a humanly visible gamut (i.e. the gamut of the expanded sRGB space is comprised of 2^{48} colors and includes all humanly visible colors).

Regarding claim 6, the gamut expanded sRGB color space of IEC 61966-2-2 is inherently linear in visual intensity.

Regarding claim 8, the gamut expanded sRGB color space of IEC 61966-2-2 includes a color space defined by a gamut that extends into negative component values and beyond 1.0 when normalized to 1.0 in RGB (equations 2-4 show that the gamut expanded sRGB values can be negative or greater than 1.0 when normalized).

Regarding claim 9, 10, 17, and 18, IEC 61966-2-2 discloses the mapping includes multiplying the normalized values by a predetermined matrix as claimed (equation 6).

Regarding claims 11-13 and 19-21, these claims appear to recite features that do not constitute critical inventive aspects of the present invention. Rather, they seem to denote design preferences that do not substantially alter the functionality of the system as a whole.

Regarding claim 14 and 22, the color data values of Hidaka's first device are either premultiplied or non-premultiplied.

7. Claims 4, 7, 16, and 60 rejected under 35 U.S.C. 103(a) as being unpatentable over Hidaka, IEC 61966-2-2, and U.S. Patent 5,946,113 by Pritchett.

Regarding claim 4, neither Hidaka nor IEC 61966-2-2 suggest clipping the color data values for the second device when the gamut expanded sRGB values lie outside a range of the RGB values of the second device.

Pritchett discloses a similar color management system that utilizes an expanded RGB color space for performing color space conversion between devices utilizing different color space profiles. In particular, Pritchett discloses clipping the color data values for the second device when the expanded RGB values extend beyond the limits of the RGB values for the second device (column 8, lines 25-30).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Hidaka and IEC 61966-2-2 by Pritchett to achieve the claimed invention since Pritchett teaches that clipping effectively eliminates extraneous color data that is unable to be retained by the destination device.

Regarding claims 7 and 16, as established above for claims 15 and 23, the gamut expanded sRGB color space of IEC 61966-2-2 comprises an XsRGB (i.e. an expanded sRGB) color space that includes at least the visible range of color values. However, neither Hidaka nor IEC 61966-2-2 disclose the use of an alpha channel as claimed.

Regarding claim 60, the combination of Hidaka and IEC 61966-2-2 discloses all of the limitations of claim 60 except representing at least one of super transparent and super opaque colors using an alpha channel in the expanded gamut sRGB color space, as claimed.

Pritchett discloses a similar color management system that utilizes an expanded RGB color space for performing color space conversion between devices utilizing different color space profiles. Pritchett also teaches the utilization of an alpha channel in order to represent a pixel's opacity, as was conventional systems (column 7, lines 3-15).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Hidaka and IEC 61966-2-2 by Pritchett to achieve the claimed invention of claims 7, 16, and 60 by including an alpha channel in the expanded gamut sRGB, since Pritchett teaches that the alpha channel provides useful additional information pertaining to the opacity of a pixel in an RGB format.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (703) 306-3489. The examiner can normally be reached Monday through Thursday from 8:00 to 5:30. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au, can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2600 Customer Service Office whose telephone number is (703) 306-0377.

AMELIA M. AU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

CML
Group Art Unit 2623
3 December 2003